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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/609,406	07/01/2003	Jens Gebhardt	06580024AA	9432

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EXAMINER

BARNEY, SETH E

ART UNIT PAPER NUMBER

3752

DATE MAILED: 10/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/609,406

Applicant(s)

GEBHARDT, JENS

Examiner

Seth Barney

Art Unit

3752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 5-12, 14, 16, 17, 21-23 and 25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 13, 15, 18-20 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 April 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "103A" has been used to designate both the open coil assembly and the contact surface. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the open and closed coils must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. As currently drawn, 103A and 103B are designated as the coils, but the drawings are drawn with cross hatching which is not the conventional way to designate coils.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate

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prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to because the cross-hatchings in Figures 1A and 1B are not consistent. In Figure 1A the cross hatchings of coils 103B are in the same direction as the cross hatchings of the spool, but because these two parts are side by side it appears as if they are one piece. Adjacent parts should not have identical cross-hatchings unless they are one integral piece. Similarly, the spools 103A and 103B are one single piece, and the cross hatchings above and below the spool should be in the same direction. The Drawings submitted on 7/1/03 (while having other objections) did have the correct cross-hatching. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being

amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 24 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,574,844 to Neff et al.

Neff discloses a kit having a longitudinally slideable spool (73) including an element reducing or minimizing latching effects (114,134) between the spool and end caps of the fuel injector.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-4, 13, 15, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,992,821 to Rookes in view of U.S. Patent No. 4,574,844 to Neff et al.

Regarding claims 1 and 13, Rookes discloses a valve control body having:

- a control body
- opposing solenoid coils (16' and 18') positioned at respective end of the control body.
- a longitudinally slideable spool (14) positioned within a bore (22) of the control body and between the opposing solenoid coils.

Rookes does not disclose a mechanism which at least minimizes fluid accumulation.

Neff discloses a longitudinally slideable spool (73) within a bore (22) including a mechanism (114, 134) which reduces fluid accumulation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add the sealing O-ring of Neff to the slideable spool of Rookes in order to reduce fluid accumulation.

Regarding claims 2 and 15, the sealing O-ring of Neff is located in the groove of the spool.

Regarding claim 3, the seal of Neff is an O-ring.

Regarding claim 4, the seal is positioned proximate to the a first end of the control body. See Figure 3 of Neff.

Regarding claim 18, the O-ring, by reducing fluid accumulation would also prevent latching effects.

8. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,964,406 to Zuo in view of U.S. Patent No. 4,574,844 to Neff et al.

Regarding claim 19, Zuo discloses a fuel injector having:

- a body control valve having inlet port and working ports. See Figure 1.
- a first and second solenoid coil (13, 14) positioned at opposing ends of the control body.
- a slideably mounted spool (30) arranged between the first and second solenoid coils. See Figure 1.
- an intensifier chamber having a piston (50) and plunger (51) assembly, wherein the intensifier chamber is in fluid communication with the working ports. See Figure 1 and column 4 lines 21 to 45.
- a high pressure fuel chamber arranged below the portion of the plunger. See Figure 1.
- a needle chamber having a needle (60) responsive to an increased fuel pressure created in the high pressure chamber. See column 3 lines 39 to 55.

Zuo does not disclose means for minimizing fluid accumulation between the end of the spool and at least one of the first and second solenoid coils. Neff discloses a longitudinally slideable spool (73) within a bore (22) including a mechanism (114,134) which reduces fluid accumulation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add the sealing O-ring of Neff to the slideable spool of Zuo in order to reduce fluid accumulation. The O-ring, by reducing fluid accumulation would also prevent latching effects.

Regarding claim 20, the seal of Neff is located within a groove of the spool and is in slideable contact with a bore wall of the control valve.

Response to Arguments

9. Applicant's arguments with respect to claims 1-4,13,15,18-20, and 24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seth Barney whose telephone number is (571)272-4896. The examiner can normally be reached on 7:30am-5:00pm (Mon-Fri), first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Scherbel can be reached on (571)272-4919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seth Barney
Examiner
Art Unit 3752

sb



David A. Scherbel
Supervisory Patent Examiner
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